Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
DENTSPLY AH 26 POWDER

SYNONYMS

PROPER SHIPPING NAME
HEXAMETHYLENETETRAMINE

PRODUCT USE
Root canal filling material.

SUPPLIER
Company: Dentsply (Australia) Pty Ltd (ABN: 15 004 290 322)
Address:
11-21 Gilby Road
Mount Waverley
VIC, 3149
AUS
Telephone: +61 3 9538 8240
Emergency Tel: 0413 830 239
Fax: +61 3 9538 8260

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

POISONS SCHEDULE
None

RISK
Highly flammable.
May cause SENSITISATION by inhalation and skin contact.
Cumulative effects may result following exposure*.
May produce discomfort of the eyes and skin*.
Limited evidence of a carcinogenic effect*.
* (limited evidence).

SAFETY
Do not breathe dust.
Avoid contact with eyes.
Wear suitable protective clothing.
To clean the floor and all objects contaminated by this material, use water and detergent.
Keep away from food, drink and animal feeding stuffs.
In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.

continued...

If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
hexamine	100-97-0	10-25
silver	7440-22-4	2.5-10
titanium dioxide	13463-67-7	2.5-10
non hazardous ingredients [manufacturer]		NotSpec

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

EYE

- If in eyes, hold eyelids apart and flush the eye continuously with running water.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

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NOTES TO PHYSICIAN

Treat symptomatically.
May decompose in acid environment of stomach.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

DO NOT USE WATER or FOAM.
For SMALL FIRES:
Dry chemical, soda ash or lime.
For LARGE FIRES:
DRY sand, dry chemical, soda ash or lime;
OR withdraw and allow fire to burn itself out.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Fight fire from a safe distance, with adequate cover.
- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1000 metres in all directions.

FIRE/EXPLOSION HAZARD

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Dry dust can be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
- Build-up of electrostatic charge may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Combustion products include.
carbon dioxide (CO_2).
formaldehyde.
nitrogen oxides (NO_x).
metal oxides.
other pyrolysis products typical of burning organic material.

FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

HAZCHEM

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continued...

Personal Protective Equipment

PERSONAL PROTECTION EQUIPMENT
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set - 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Remove all ignition sources.
- DO NOT touch or walk through spilled material.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Prevent dust cloud.
- With clean shovel (preferably non-sparking) place material into clean, dry container and cover loosely.
- Move containers from spill area.
- Control personal contact by using protective equipment.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- DO NOT touch or walk through spilled material.
- Control personal contact by using protective equipment.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain or cover with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labelled containers for recycling.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area with water and dike for later disposal; prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

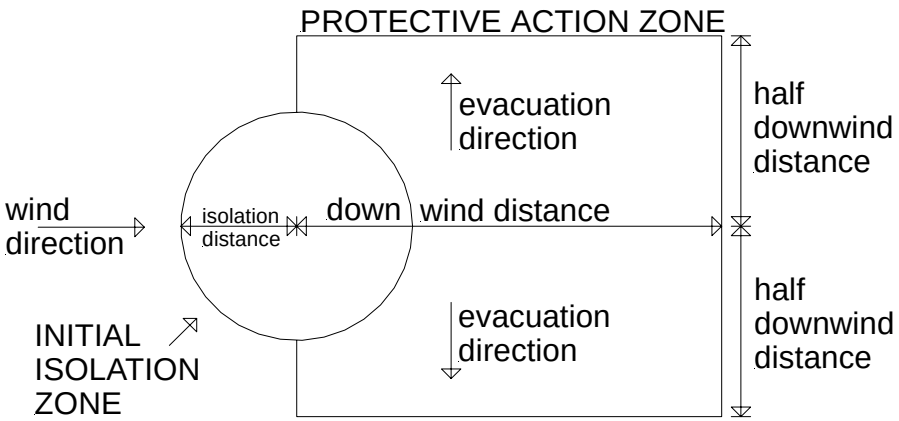
EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (ppm)	Revised IDLH Value (mg/m3)
Silver (metal dust and soluble compounds, as Ag)		10
Titanium dioxide		5,000

NOTES
as Ag; metal dust and soluble compounds

PROTECTIVE ACTIONS FOR SPILL

continued...



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	20

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
5 Guide 133 is taken from the US DOT emergency response guide book.
6 IERG information is derived from CANUTEC - Transport Canada.

EMERGENCY RESPONSE PLANNING GUIDLINES (ERPG)
The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

hexamine	500 mg/m³
silver	10 mg/m³
titanium dioxide	500 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

continued...

hexamine	50 mg/m³
silver	0.5 mg/m³
titanium dioxide	15 mg/m³

other than mild, transient adverse effects
without perceiving a clearly defined odour is:

hexamine	30 mg/m³
silver	0.3 mg/m³
titanium dioxide	15 mg/m³

The threshold concentration below which most people.
will experience no appreciable risk of health effects:

hexamine	10 mg/m³
silver	0.01 mg/m³
titanium dioxide	15 mg/m³

American Industrial Hygiene Association (AIHA)

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid smoking, naked lights or ignition sources.
- When handling, DO NOT eat, drink or smoke.
- Avoid contact with incompatible materials.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Working clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing/handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

For low viscosity materials and solids:
Drums and jerricans must be of the non-removable head type.
Where a can is to be used as an inner package, the can must have a screwed enclosure.
For materials with a viscosity of at least 2680 cSt. (23 deg. C):
- Removable head packaging and
- cans with friction closures may be used.
-

Where combination packages are used, there must be sufficient inert absorbent material to absorb completely any leakage that may occur, unless the outer packaging is a close fitting moulded plastic box and the substances are not

continued...

incompatible with the plastic.
All combination packages for Packing group I and II must contain cushioning material.

STORAGE INCOMPATIBILITY

- Avoid oxidising agents, acids, acid chlorides, acid anhydrides.

STORAGE REQUIREMENTS

FOR MINOR QUANTITIES:
- Store in an indoor fireproof cabinet or in a room of noncombustible construction.
- Provide adequate portable fire-extinguishers in or near the storage area.

FOR PACKAGE STORAGE:
- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry, well ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Protect containers from exposure to weather and from direct sunlight unless: (a) the packages are of metal or plastic construction; (b) the packages are securely closed are not opened for any purpose while in the area where they are stored and (c) adequate precautions are taken to ensure that rain water, which might become contaminated by the dangerous goods, is collected and disposed of safely.
- Ensure proper stock-control measures are maintained to prevent prolonged storage of dangerous goods.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³
Australian Exposure Standards	Silver, metal		0.1				
Australian Exposure Standards	Silver, soluble compounds (as Ag)		0.01				
Australian Exposure Standards	Titanium dioxide		10				

No data available for hexamine as (CAS: 100-97-0)

ODOUR SAFETY FACTOR (OSF)

OSF=0.36 (hexamine)
Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.
Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.
The Odour Safety Factor (OSF) is defined as:
OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm
Classification into classes follows:

continued...

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	As "A" for 50-90% of persons being distracted
C	1-26	As "A" for less than 50% of persons being distracted
D	0.18-1	10-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As "D" for less than 10% of persons aware of being tested

.

EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

Composite Exposure Standard for Mixture (TWA) :3 mg/m³.
Operations which produce a spray/mist or fume/dust, introduce particulates to the breathing zone.
If the breathing zone concentration of ANY of the components listed below is exceeded, "Worst Case" considerations deem the individual to be overexposed.
Component Breathing Zone ppm Breathing Zone mg/m³ Mixture Conc (%).

Component	Breathing Zone (mg/m³)	Mixture Conc (%)
hexamine	3.0000	25.0

INGREDIENT DATA

HEXAMINE:
CEL TWA: 3 mg/m³ (compare OEL TWA (Sweden))

SILVER:
Not available. Refer to individual constituents.

TITANIUM DIOXIDE:
IDLH Level: 5000 mg/m³
Animal studies at 10 mg/m³ show no significant fibrosis, possibly reversible tissue reaction and the architecture of lung air spaces remains intact.

PERSONAL PROTECTION

EYE

- Safety glasses with side shields

continued...

- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

Wear physical protective gloves, eg. leather.
Wear safety footwear.
NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

OTHER

- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.

GLOVE SELECTION INDEX

4993-64 #76-P() ~g-P

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered. Such protection might consist of:

(a): particle dust respirators, if necessary, combined with an absorption cartridge;
(b): filter respirators with absorption cartridge or canister of the right type;
(c): fresh-air hoods or masks

- Build-up of electrostatic charge on the dust particle, may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Yellow, odourless flammable powder; partly soluble in water.

PHYSICAL PROPERTIES

Molecular Weight: Not Applicable
Melting Range (°C): Not Available
Boiling Range (°C): Not Available
Specific Gravity (water=1): Not Available

continued...

Solubility in water (g/L): Partly Miscible
pH (1% solution): Not Available
Volatile Component (%vol): Not Available
Relative Vapour Density (air=1): Not Available
Lower Explosive Limit (%): Not Available
Autoignition Temp (°C): Not Available
State: Divided Solid

pH (as supplied): Not Available
Vapour Pressure (kPa): Not Available
Evaporation Rate: Not Available
Flash Point (°C): Not Applicable
Upper Explosive Limit (%): Not Available
Decomposition Temp (°C): Not Available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE

Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis);
temporary impairment of vision and/or other transient eye damage/ulceration may occur.

SKIN

Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis.

continued...

At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.
Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.
Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

CHRONIC HEALTH EFFECTS

Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung. A prime symptom is breathlessness. Lung shadows show on X-ray. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
Practical evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a substantial number of individuals at a greater frequency than would be expected from the response of a normal population. Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking. Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals. Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping. Silver is one of the most physically and physiologically cumulative of the elements. Chronic exposure to silver salts may cause argyria, a permanent ashen-grey discolouration of the skin, conjunctiva and internal organs (due to the deposit of an insoluble albuminate of silver). The respiratory tract may also be a site of local argyria (following chronic inhalation exposures) with a mild chronic bronchitis being the only obvious symptom.

TOXICITY AND IRRITATION

Not available. Refer to individual constituents.
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

HEXAMINE:

TOXICITY	IRRITATION
Intravenous (rat) LD50: 9200 mg/kg	Nil Reported
Subcutaneous (mouse) LD50: 215 mg/kg	
Inhalation (rat) TCLo: 350 mg/m3/2h/3W-I	

SILVER:
Not available. Refer to individual constituents.

TITANIUM DIOXIDE:

continued...

TOXICITY IRRITATION
Skin (human): 0.3 mg/3d-I Mild

Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.

DO NOT discharge into sewer or waterways.
Refer to data for ingredients, which follows:

HEXAMINE:
log Pow (Verschueren 1983): 0.91025641
BOD5: 1.31

log Kow : -2.13- -2.34
BOD 5 if unstated: 0.015-0.026
log Kow : -2.13- -2.34
BOD 5 if unstated: 0.015-0.026

SILVER:
The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment) Appendix 8, Table 1
Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the European Communities.
BCF : 11-150
The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment) Appendix 8, Table 1
Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the European Communities.
BCF : 11-150

Section 13 - DISPOSAL CONSIDERATIONS

Puncture containers to prevent re-use and bury at an authorised landfill.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licenced land-fill or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

continued...

Section 14 - TRANSPORTATION INFORMATION

Shipping Name:
HEXAMETHYLENETETRAMINE
Dangerous Goods Class: 4.1, None
UN/NA Number: 1328
Packing Group: III
Labels Required: flammable solid
Additional Shipping Information:
International Transport Regulations:
IMO: 4.1

HAZCHEM

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Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE

None

REGULATIONS

hexamine (CAS: 100-97-0) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)

silver (CAS: 7440-22-4) is found on the following regulatory lists:
Australian Inventory of Chemical Substances (AICS)

titanium dioxide (CAS: 13463-67-7) is found on the following regulatory lists:
Australia High Volume Industrial Chemical List (HVICL)
Australian Inventory of Chemical Substances (AICS)

Section 16 - OTHER INFORMATION

Issue Date: Mon 11-Jul-2005
Print Date: Mon 11-Jul-2005